

# Portland East Quadrangle, Maine

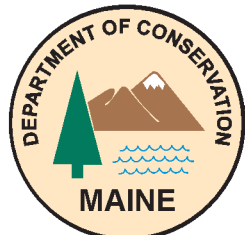
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Funding for the preparation of this map was provided by the Maine Geological Survey.



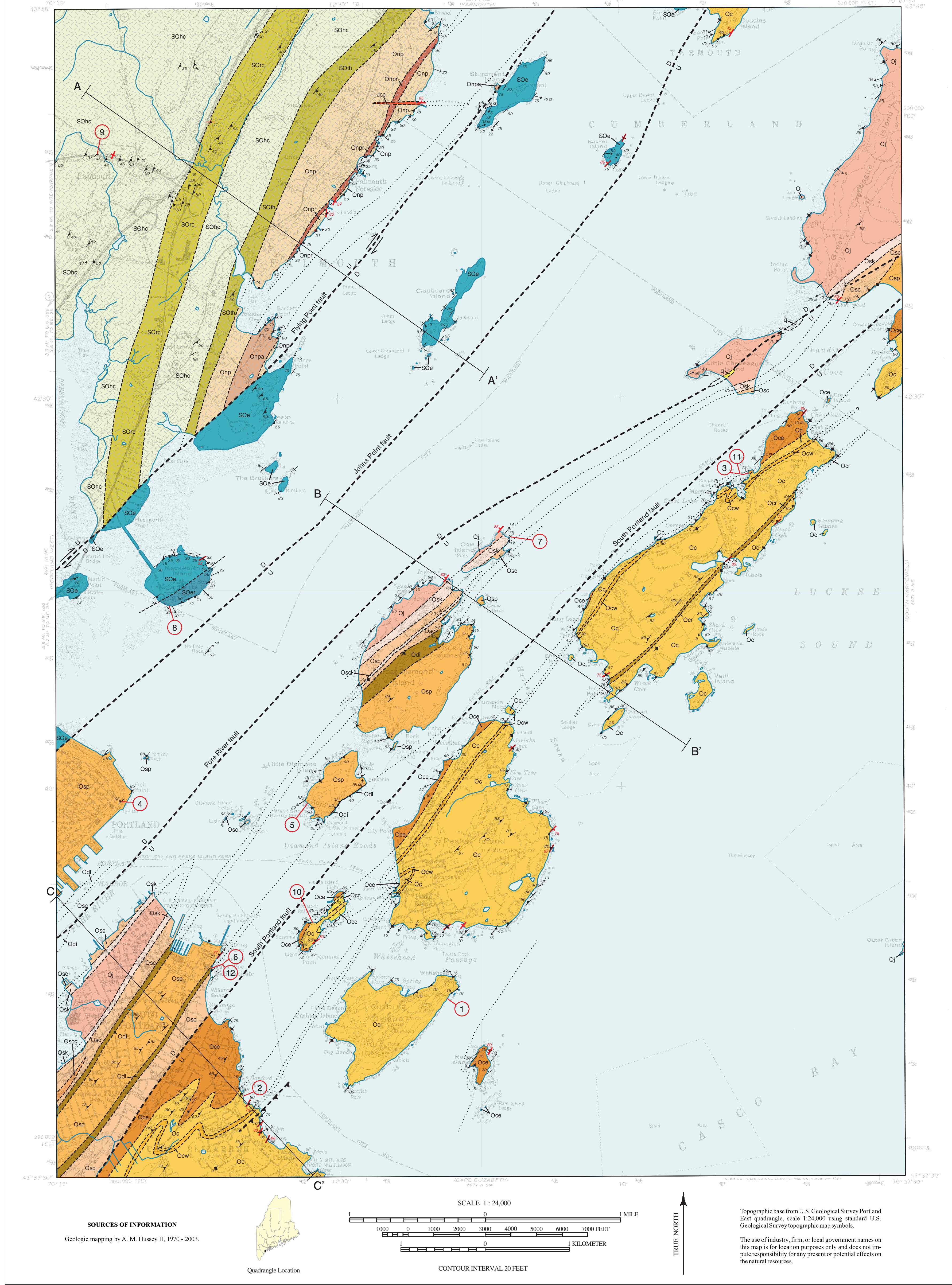
## Maine Geological Survey

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Open-File No. 03-90  
2003

This map accompanied  
by a 12 p. report.

# Bedrock Geology



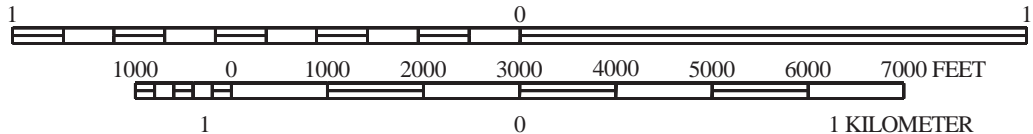
### SOURCES OF INFORMATION

Geologic mapping by A. M. Hussey II, 1970 - 2003.



Quadrangle Location

SCALE 1:24,000



CONTOUR INTERVAL 20 FEET



Topographic base from U.S. Geological Survey Portland East quadrangle, scale 1:24,000 using standard U.S. Geological Survey topographic map symbols.

The use of industry, firm, or local government names on this map is for location purposes only and does not implicate responsibility for any present or potential effects on the natural resources.

## EXPLANATION OF UNITS

### DIKES AND FAULT-RELATED ROCKS

- Jurassic (?)**
  - Jcc** Porphyritic and non-porphyritic diabase and basalt dikes and sills, 5 cm to 3 m thick.
  - q** Silticified zone related to fault. Massive veined white quartz rock.
  - Overprint pattern indicates areas of extensive injection by granite pegmatite stringers, northwest of Flying Point fault.

### STRATIFIED ROCKS

#### Early Silurian to Late Ordovician (?)

#### CENTRAL MAINE SEQUENCE

- SOhc** **Hutchins Corner Formation.** Medium-gray fine- to medium-grained quartz-plagioclase-biotite gneiss with or without 2 to 6 cm beds of medium greenish gray quartz-plagioclase-diopside-hornblende-sphene granulites or gneiss. Heavily injected by pegmatite.
- SOrc** **Richmond Corner Formation.** Medium brownish gray quartz-plagioclase-biotite gneiss locally with almandine garnet and sillimanite. More strongly migmatized than SOhc.
- SOth** **Torrey Hill Formation.** Rusty-weathering schistose muscovite-biotite-quartz schist and gneiss, locally with abundant sillimanite.

#### MERRIMACK GROUP

- SOe** **Elliot Formation.** Fine-grained brownish-gray-weathering strongly sheared calcareous biotite-chlorite-muscovite phyllite, regularly alternating with thin interlayers of dark gray chlorite-muscovite phyllite.
- SOer** Same as rest of formation, but with 2 to 30 m intervals of rusty phyllite.

### Ordovician (?)

#### FALMOUTH-BRUNSWICK SEQUENCE

- Onp** **Nehumkeag Pond Formation.** Light- to medium-gray quartz-plagioclase-biotite-muscovite gneiss and schist, slightly to strongly migmatized.
- Onpr** Rusty-weathering phyrroblastic plagioclase-quartz-biotite gneiss with minor amphibolite.
- Onpa** Amphibolite, locally with light- to medium-gray quartz-plagioclase-biotite-muscovite gneiss and schist. Possibly equivalent to Mount Ararat Formation to the north.

### Ordovician (probably Middle)

#### CASCO BAY GROUP

- Oj** **Jewell Formation.** Rusty and non-rusty, graphitic and non-graphitic brownish-weathering phyllite or schist with muscovite, biotite, and garnet in the garnet zone; muscovite, biotite, garnet, andalusite, staurolite, and chloritoid in the andalusite-staurolite zone. Includes zones of non-rusty green chlorite-rich phyllite not separately mapped. (See report for metamorphic zones.)
- Osk** **Spurwink Metalmestone.** Medium-gray ribbon-layered impure metalimestone with interbeds of biotite-chlorite phyllite.
- Osc** **Scarboro Formation.** Lithology indistinguishable from the Jewell Formation. Has rare beds of quartz-plagioclase-muscovite-biotite schist.
- Oscd** Medium-gray ribbon-layered impure metalimestone with interbeds of biotite-chlorite phyllite.
- Oscg** Unnamed volcanogenic member. Medium greenish gray chlorite-garnet-quartz phyllite, generally non-rusty weathering.

### Ordovician (?)

- Odi** **Diamond Island Formation.** Rusty-orange-weathering black quartz-muscovite-graphite phyllite.
- Osp** **Spring Point Formation.** Medium-dark greenish gray plagioclase-chlorite-actinolite amphibolite. Some zones preserve 2 to 25 cm ovoid blocks of light gray- to greenish-gray metavolcanic rocks.
- Oce** **Cape Elizabeth Formation.** Medium gray quartz-plagioclase-biotite-muscovite-chlorite-garnet phyllite with interbeds of more micaceous phyllite or schist.
- Oc** **Cushing Formation.** Light gray plagioclase-quartz-microcline-muscovite-biotite gneiss. Some zones have small (1 to 4 mm) megacrysts of blue quartz, plagioclase, and clear gray quartz. Some zones preserve 2 to 20 cm irregular blocks of light- and medium-gray gneiss similar to the main rock type, and dark gray fine-grained granulites. Volcanic samples from Danford Cove, South Portland have been dated at  $471 \pm 3$  Ma (J. N. Alekikhoff) and  $473 \pm 3$  Ma (R. D. Tucker). See report for details.
- Ocl** Heterogeneous metavolcanic assemblage including fine-grained pink cotecite, amphibolite, and medium gray quartz-plagioclase-biotite gneiss.
- Oclw** White schistose quartz-muscovite gneiss with minor garnet and plagioclase; locally rusty-weathering.
- Oclr** Rusty-weathering white to very light gray quartz-feldspar-muscovite schist.

## EXPLANATION OF SYMBOLS

- Outcrop of mapped unit.
- Strike and dip of bedding. (inclined, vertical)
- Strike and dip of gneissic foliation. (inclined, vertical)
- Direction and angle of inclination of lineations. (plunging, horizontal)
- Stratigraphic or intrusive contact.
- Fault. Arrows indicate sense of motion. U = upthrown block; D = downthrown block.
- Thrust fault. Teeth on overthrust block.
- Photo locality.

### GEOLOGIC TIME SCALE

Geologic Age	Absolute Age*
Cenozoic Era	0-65
Mesozoic Era	65-145
Triassic Period	200-253
Paleozoic Era	253-300
Carboniferous Period	300-360
Devonian Period	360-418
Silurian Period	418-443
Ordovician Period	443-489
Cambrian Period	489-544
Precambrian time	Older than 544

\* In millions of years before present.

